

REMARKS

Reconsideration of this application, as amended, is respectfully requested.

Applicants confirm the election of the claims of Group I, claims 26-35 and 46-50 with traverse. The Examiner alleges that the claims lack unity because the common technical feature is allegedly obvious over Bristowe. Applicants respectfully submit that Bristowe does not render the claims obvious for reasons discussed below, and, therefore, respectfully request that the unity of invention objection be withdrawn.

Claim 46 has been amended to overcome the objection thereto.

Claims 26, 29, 31, 34, 46 and 49 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over Bristowe. Claims 26-30 and 46-50 were rejected as allegedly obvious of Kulkarni. Claims 27, 28, 30, 32, 33, 35, 47, 48 and 50 were rejected as allegedly obvious over the combination of Bristowe and Kulkarni. Applicants respectfully traverse.

Neither the examples of Bristowe nor those of Kulkarni show any addition of any pigments.

For coatings of ≤ 20 μm thickness, it is difficult to obtain a coating layer with desirable properties according to the present invention because there are only small windows within which to work, especially if there is a content of e.g., 35% of electroconductive particles so that the matrix of organic binders is significantly diluted. If the coating is smaller than 10 μm , there is an insufficient amount of organic binder material to generate a high corrosion resistance with a standard UV binder material.

Bristowe describes resins based on vinyl ester urethane with a polyoxyalkylene bisphenol A portion as well as chemically curable or radiation curable coating compositions. Bristowe is primarily directed to the preparation of a specific chemical resin system and indicates the components necessary for curing. Therefore, it describes a resin preparation that is not describe in the present application. The resins described in Bristowe may be used as one of the starting materials for the present application to prepare a composition as described in the present application. Bristowe does not mention any detail for modifications to generate

electroconductive coatings on metallic surfaces that may be used for electric welding of e.g., two steel sheets coated with such organic electroconductive coatings to generate a composite.

Organic coatings of Bristowe showing a pencil hardness of F or even 9 H (examples 13, 14) are extremely hard and brittle; therefore, such a coating is too brittle and may be destroyed easily by every strong impact or metal forming (e.g., to press a hood from a steel sheet) as this will need a higher flexibility.

The MEK test for chemical resistance with 300 rubbings as indicated in Bristowe in several examples is extremely high, but no standard and no specific test conditions are mentioned as they may differ. The MEK resistance is proportional to the dry film thickness, as with this solvent a certain amount of the organic coating is removed. Even the data of 300 rubbings indicate extremely hard coatings. The thicker the dry film, the more rubbings are possible.

Examples 13 to 14 of Bristowe are directed to UV coatings, but they show a dry film thickness of 25.4 μm (examples 8, 9, 11) or 37.9 μm (examples 13, 14; but no thickness indication for the examples 10 and 12). For such thick coatings having no or only a very low load of inorganic particles like pigments, it is no problem to generate a high corrosion resistance.

An organic coating of e.g., 25 μm should have a corrosion resistance depending on the mathematical curve that is perhaps 3 times or even more than 10 times of that compared with the coating of the same composition of e.g., 8 μm , as the curve develops non-linearly with a significant increase to higher dry film thicknesses.

There is no chance for an electric welding process to generate a composite under conditions such as in the automobile industry from two such coated steel sheets with organic coatings of 25 μm dry film thickness on each side if the content of highly electroconductive particles would not be at least 80% by weight of all solid components. With an even higher dry film thickness there is no chance to weld such steel sheets. With at least 80% by weight solid content, there is no organic matrix between the particles. There is a need not to have too much organic insulating substance within the four coatings going to be welded (two coatings on the sides of a steel sheet whereby two coated sheets are welded). Typically today, the coatings for

welding of organically coated steel sheets should be less than 10 μm .

Bristowe discloses the use magnetic iron oxide to alter the physical properties and mentions magnetic iron oxide as one of five different fillers. Typically, a filler will be used to save money, as the filter should be of a lower price than all the other components of the composition, and to dilute the composition without generating an essential porosity. An alteration of the properties of the organic coating would only be done with high quality powders, but not with low-priced fillers. A filler should be very low-priced and should be used for low-priced filling of the volume with any material. There may be even low-priced low-quality magnetic iron oxide without significant purity and with certain electroconductive and magnetic properties, perhaps even milled natural mineral powder of magnitude, Fe_3O_4 , but no synthetic high quality powder. But for UV coatings, it is more preferable to add materials that do not absorb the UV radiation. As there is mentioned "magnetic iron oxide" and "altered physical properties", this implies to modify the properties to a magnetic coating, but not as easily to an electroconductive coating. The coatings according to the present application are not per se be magnetic, but only electroconductive to be able to be welded as a so-called "welding primer".

Kulkarni discloses a paint composition which may form electroconductive coatings by its content of polyaniline, but not by an addition of inorganic electroconductive particles. It does not disclose mica particles coated with graphite that are not normally or only very seldom used in paint technology. Among the additives, "iron oxides" are mentioned: There is no indication that this is added because of the electroconductive properties of the black magnetic Fe_3O_4 , but usually only other Fe oxides are added for coloring a paint, e.g., brownish-red with Fe_2O_3 or yellowish-brownish with $\text{Fe}_2\text{O}_3 \cdot \text{H}_2\text{O}$. These last mentioned compounds may be added in the form of particles or as colloidal or gel-like substances. Of these "iron oxides", only the black magnetic Fe_3O_4 shows significant electroconductivity. The next to last paragraph of column 2 refers to pigments of paints of the state of the art that may be used as corrosion inhibition pigments, but in most cases these refer to silicate or silica pigments; in a few cases aluminum tripolyphosphate pigments are used as corrosion inhibiting pigments. Such corrosion inhibition pigments are typically electrically non-conductive and will reduce the electroconductivity of the coating strongly even if only added 0.5 to 1 % by weight.

The coatings of Kulkarni contain a) a resin on the base of an organic sulfonic acid like a polystyrene sulfonic acid, b) a film-forming organic polymer, e.g., based on acrylics, polyesters, epoxies, urethanes, etc., and optionally an intrinsically electroconductive organic polymer like polyaniline. Although it is indicated that the polymer b) may be cured by heat, UV etc., it is not clear if a curing by irradiation of UV light or heat is necessary and which type of curing is used in the examples. Additionally, a non-ionic self cross-linking acrylic emulsion is added in Example 3, and the composition of example 4 contains an internal amine crosslinker. Therefore, the mention of UV curing is vague. There is no hint to add a photoinitiator and to select polymers that may be radically cured as such polymers have to be selected to be polymerized in such a way.

Further, there is no mention of a coating thickness except that it is at least 0.1 mils. Even in the examples, there is no coating thickness and no coating weight described so that a correlation of the corrosion inhibiting effect of the coating cannot be evaluated, as a thick coating will always have a significant better corrosion resistance than a thin one. Typically, one coating layer of a paint will have a thickness in the range of 20 to 50 microns and even up to now there are relatively few applications with a thickness layer below 10 microns.

In view of the foregoing, allowance is respectfully requested.

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Respectfully submitted,
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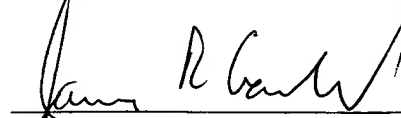
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A handwritten signature in black ink, appearing to read 'James R. Crawford', is written over a horizontal line.

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